

# PATENT ABSTRACTS OF JAPAN

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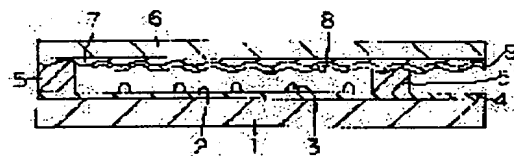
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## (54) TRANSPARENT TOUCH PANEL

### (57)Abstract:

**PURPOSE:** To improve visibility of a lower display by forming a surface on the side wherein an electrode of an insulating substrate is provided, into an irregular shape so that an annular interference stripe can be prevented from being generated.

**CONSTITUTION:** In a transparent touch panel wherein the fellow insulating substrates 1, 6 provided with electrodes 2, 8 in surfaces thereof are arranged oppositely to each other, the insulating substrate 6, in which a surface 7 on the side provided with the electrode 8 is formed into an irregular shape, is provided. A surface of the other insulating substrate may be formed into the irregular shape.



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CLAIMS

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[Claim(s)]

[Claim 1] The transparence touch panel characterized by having the insulating substrate which made concave convex the front face of the side which prepares an electrode in the transparence touch panel which countered and has arranged the insulating substrates which prepared the electrode in the front face.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a transparence touch panel.

[0002]

[Description of the Prior Art] Information is inputted or the transparence touch panel is used for putting on the front face of display display objects, such as liquid crystal, and plasma, an electroluminescence, carrying on a drawing etc., and directing a coordinate.

[0003] This transparence touch panel has composition as shown in drawing 2 . That is, while forming the transparence electric conduction film 12 in the front face of the insulating substrate 11 which consists of a glass plate etc., the insulating dot-like spacer 13 is formed. Moreover, the spacers 14, such as a double-sided tape, are stuck around this insulating substrate 11. And the insulating substrate 16 which consists of a high polymer film which formed the transparence electric conduction film 15 in the front face is put on the insulating substrate 11 through this spacer 14.

[0004] The dot-like spacer 13 usually has magnitude about 300 micrometers and whose height the diameter of a pars basilaris ossis occipitalis is 30 micrometers. However, in the spacer 13 of this magnitude, since it is easy to be conspicuous, the display under a touch panel becomes hard to see. Moreover, although a signal cannot be inputted in a surrounding part centering on this spacer 13 but it becomes discontinuity, the range which cannot be inputted, so that a spacer 13 is large becomes large. Therefore, the diameter of a pars basilaris ossis occipitalis makes the spacer 13 the magnitude about 100 micrometers and whose height are about about 10 micrometers recently.

[0005]

[Problem(s) to be Solved by the Invention] However, if one insulating substrate 16 hangs down and the insulating substrate 11 of another side is approached, an annular interference fringe will arise. And there is a fault to which the display under a touch panel becomes hard to see for this interference fringe.

[0006] The purpose of this invention improves the above fault and offers the legible transparence touch panel of a lower display.

[0007]

[Means for Solving the Problem] This invention offers the transparence touch panel characterized by having the insulating substrate which made concave convex the front face of the side which prepares an electrode in the transparence touch panel which countered and has arranged the insulating substrates which prepared the electrode in the front face, in order to attain the above-mentioned purpose.

[0008] A concave convex front face may be formed in both that what is necessary is just to form at least in one side of the insulating substrate which counters. Moreover, the configuration of irregularity from which an inclination changes continuously is effective like the shape of a wave.

[0009]

[Function] Light is scattered about inside a transparence touch panel, therefore an annular interference fringe stops arising by making concave convex the front face of the side which prepares the electrode of an insulating substrate.

[0010]

[Example] Hereafter, this invention is explained based on the example of illustration. In drawing 1 , 1 is a

glass insulating substrate with a thickness of 1.1mm. 2 is an electrode which consists of transperence electric conduction film of ITO with a thickness of 500A prepared in the front face of this insulating substrate 1. 3 is the diameter of 30 micrometers of a pars basilaris ossis occipitalis prepared in the front face of an insulating substrate 1, and the spacer of the shape of a dot with a height of 4 micrometers. 4 is a current collection electrode which consists of Ag which connected to the electrode 2 and was prepared in the front face of an insulating substrate 1. 5 is a spacer which consists of a double-sided tape stuck around the insulating substrate 1. 6 is an insulating substrate which consists of high polymer films, such as polyester, it has put on the insulating substrate 1 through the spacer 5, and especially the front face 7 by the side of an insulating substrate 1 has wave-like concave convex. 8 is an electrode which consists of transperence electric conduction film of ITO with a thickness of 500A prepared in this front face 7. 9 is a current collection electrode which consists of Ag which connected to this electrode 8 and was prepared in the front face 7 of an insulating substrate 6.

[0011] In addition, electrodes 2 and 8 vapor-deposit indium oxide by the sputtering method etc., and form it. Moreover, the dot-like spacer 3 is formed with photography. And the current collection electrodes 4 and 9 form Ag etc. by carrying out screen-stencil etc.

[0012] Furthermore, in order to form the concave convex front face 7 in an insulating substrate 6, spreading hardening of the thermosetting aquosity emulsion resin liquid which makes an epoxy denaturation silicone emulsion a subject for polyester film etc. into an extension membrane formation process is carried out on the front face. Or polyester resin is first applied to front faces, such as polyester film, next, the ultraviolet-rays hardening resin of the epoxy acrylate which added 5g of silicas of impalpable powder to resin 100g is applied to the front face of this polyester resin layer, and the concave convex front face 7 is formed in it.

[0013]

[Effect of the Invention] Since the front face of the side which prepares the electrode of an insulating substrate is made concave convex according to this invention the above passage, it can prevent that an annular interference fringe arises and the transperence touch panel which gives an indication legible is obtained.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The sectional view of the example of this invention is shown.

[Drawing 2] The sectional view of the conventional example is shown.

[Description of Notations]

1 Six -- Insulating substrate 2 Eight -- Electrode 7 -- Front face.

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[Translation done.]

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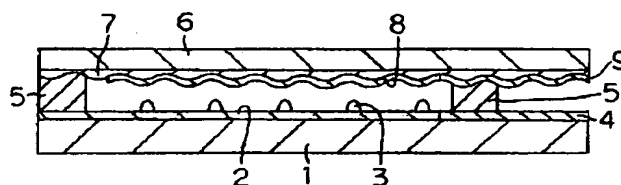
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(54) 【発明の名称】 透明タッチパネル

(57) 【要約】

【構成】 表面に電極2及び8を設けた絶縁基板1及び6どうしを対向して配置した透明タッチパネルにおいて、電極8を設ける側の表面7を凹凸状にした絶縁基板6を設ける。他方の絶縁基板1の表面を凹凸状にしてもよい。

【効果】 絶縁基板の電極を設ける側の表面を凹凸状にしているため、環状の干渉縞が生じるのを防止でき、下の表示を見易くできる。



(2)

## 【特許請求の範囲】

【請求項1】 表面に電極を設けた絶縁基板どうしを対向して配置した透明タッチパネルにおいて、電極を設ける側の表面を凹凸状にした絶縁基板を有することを特徴とする透明タッチパネル。

## 【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は透明タッチパネルに関する。

【0002】

【従来の技術】透明タッチパネルは、液晶やプラズマ、エレクトロルミネセンス等のディスプレイ表示体の表面に載せて情報を入力したり、あるいは図面等の上に載せて座標を指示するのに用いている。

【0003】この透明タッチパネルはたとえば図2に示す通りの構成になっている。すなわち、ガラス板等からなる絶縁基板11の表面に透明導電膜12を設けるとともにドット状の絶縁性のスペーサ13を設ける。また、この絶縁基板11の周辺には両面テープ等のスペーサ14を張り付ける。そして、表面に透明導電膜15を設けた高分子フィルム等からなる絶縁基板16をこのスペーサ14を介して絶縁基板11に重ねている。

【0004】ドット状のスペーサ13は、通常、底部の直径がほぼ300 $\mu$ m、高さが30 $\mu$ mの大きさになっている。しかし、この大きさのスペーサ13では目立ちやすいため、タッチパネルの下が表示が見難くなる。また、このスペーサ13を中心にして周辺の部分において信号を入力できず、不連続になるが、スペーサ13が大きいほど入力できない範囲が広がる。そのため、最近では、スペーサ13を底部の直径がほぼ100 $\mu$ m、高さがほぼ10 $\mu$ m程度の大きさにしている。

【0005】

【発明が解決しようとする課題】しかし、一方の絶縁基板16が垂れて他方の絶縁基板11に近づくと、環状の干渉縞が生じる。そしてこの干渉縞のため、タッチパネルの下が表示が見難くなる欠点がある。

【0006】本発明の目的は、以上の欠点を改良し、下の表示の見易い透明タッチパネルを提供するものである。

【0007】

【課題を解決するための手段】本発明は、上記の目的を達成するために、表面に電極を設けた絶縁基板どうしを対向して配置した透明タッチパネルにおいて、電極を設ける側の表面を凹凸状にした絶縁基板を有することを特徴とする透明タッチパネルを提供するものである。

【0008】凹凸状の表面は対向する絶縁基板の少なくとも一方に形成すればよく、両方に形成してもよい。ま

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た凹凸は波状のように、傾斜が連続的に変化する形状が効果的である。

【0009】

【作用】絶縁基板の電極を設ける側の表面を凹凸状にすることによって、透明タッチパネルの内部で光が散乱し、そのため環状の干渉縞が生じなくなる。

【0010】

【実施例】以下、本発明を図示の実施例に基づいて説明する。図1において、1は厚さ1.1mmのガラス製の絶縁基板である。2はこの絶縁基板1の表面に設けた厚さ500オングストロームのITOの透明導電膜からなる電極である。3は、絶縁基板1の表面に設けた、底部の直径30 $\mu$ m、高さ4 $\mu$ mのドット状のスペーサである。4は、電極2に接続して絶縁基板1の表面に設けたAg等からなる集電電極である。5は絶縁基板1の周辺に張り付けた両面テープからなるスペーサである。6は、ポリエステル等の高分子フィルムからなる絶縁基板であり、スペーサ5を介して絶縁基板1に重ねていて、特に絶縁基板1側の表面7が波状の凹凸状になっている。8はこの表面7に設けた厚さ500オングストロームのITOの透明導電膜からなる電極である。9はこの電極8に接続して絶縁基板6の表面7に設けたAg等からなる集電電極である。

【0011】なお、電極2及び8は酸化インジウムをスパッタリング法等により蒸着して形成する。また、ドット状のスペーサ3はフォトグラフィーにより形成する。そして集電電極4及び9はAg等をスクリーン印刷等して形成する。

【0012】さらに、絶縁基板6に凹凸状の表面7を形成するには、ポリエステルフィルム等を延伸成膜工程中に、エポキシ変性シリコンエマルジョンを主体とする熱硬化性水性エマルジョン樹脂液をその表面に塗布硬化する。あるいは、先ずポリエステルフィルム等の表面にポリエステル樹脂を塗布し、次にこのポリエステル樹脂層の表面に、微粉末のシリカをレジン100gに対し5g添加したエポキシアクリレートの紫外線硬化樹脂を塗布して凹凸状の表面7を形成する。

【0013】

【発明の効果】以上の通り、本発明によれば、絶縁基板の電極を設ける側の表面を凹凸状にしているため、環状の干渉縞が生じるのを防止でき、表示を見易くできる透明タッチパネルが得られる。

【図面の簡単な説明】

【図1】本発明の実施例の断面図を示す。

【図2】従来例の断面図を示す。

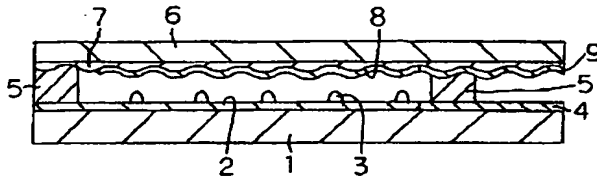
【符号の説明】

1, 6…絶縁基板、 2, 8…電極、 7…表面。



(3)

【図1】



【図2】

